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BUREAU OF PLANT INDUSTRY
WESTERN IRRIGATION AGRICULTURE
WASHINGTON, D. C.

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INDUSTRY

THE WORK OF THE TRUCKEE-CARSON RECLAMATION PROJECT EXPERIMENT FARM IN 1917

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U. S. DEPT. OF AGRICULTURE

By F. B. HEADLEY
Farm Superintendent



A Hedge of Russian Oleaster on the Grounds of the Truckee-Carson Experiment Farm.

THE TRUCKEE-CARSON Experiment Farm is located on the United States Reclamation Project of the same name, about 1 mile south of the town of Fallon, Nev. The tract consists of 160 acres withheld from entry by the Department of the Interior and set aside for use as an experiment farm.

THE WORK OF THE TRUCKEE-CARSON RECLAMATION PROJECT EXPERIMENT FARM IN 1917.

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OUTLINE OF WORK IN PROGRESS.

The work of the Truckee-Carson Experiment Farm consists of (1) field experiments in the reclamation of alkali soil, (2) laboratory work related to the field experiments in the reclamation of alkali soil, (3) variety tests of horticultural crops, (4) variety and cultural tests of general farm crops (conducted partly on private farms), and (5) the recording of weather conditions at the experiment farm and on private farms located in representative sections of the project.

The arrangement of the fields and the location of the experiments in 1917 are shown in figure 1.

WEATHER CONDITIONS.

Weather records are kept in cooperation with the United States Weather Bureau, the Biophysical Laboratory of the Bureau of Plant Industry, the University of Nevada, and with private individuals, as follows: H. M. Carter, superintendent of the Fallon Indian School, Chester Conner, of the Island District, C. G. Swingle, of the Swingle Bench, W. W. Cogswell, of the Fernley Bench, and J. D. Oliver, superintendent of the Indian School at Pyramid Lake.

During 1917 several weather records were broken. These included the lowest temperature, the coldest January, the coldest spring, the hottest summer, and the lowest annual rainfall since records have been kept. The frost-free period of 127 days was about normal. The summer temperatures were especially favorable to growing such crops as corn, sorghum, melons, and tomatoes.

Table I shows the results of the weather observations for 1917 and the average of all years since observations were begun.

TABLE I.—*Summary of climatological observations at the Truckee-Carson Experiment Farm, 1906 to 1917, inclusive.*

PRECIPITATION (INCHES).													
Year, etc.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Average for 12 years ¹ .	0.93	0.42	0.39	0.55	0.47	0.33	0.19	0.19	0.30	0.35	0.25	0.48	4.85
For the year 1917.....	.68	.70	.03	.12	.76	0	.09	.05	0	T.	.34	T.	2.77

EVAPORATION (INCHES).													
Average for 10 years ² .	1.28	1.79	4.15	6.15	8.1	9.95	10.77	9.75	6.6	3.92	2.13	.98	65.57
For the year 1917 ³.....	.....	.....	4.06	6.18	6.73	10.65	11.37	9.27	7.03	4.59	2.02	1.52	63.42

DAILY WIND VELOCITY (MILES PER HOUR).													
Average for 9 years ⁴ ..	3.5	3.7	4.7	5.6	5.1	4.5	3.5	3.2	3.2	2.8	3.0	3.0	3.8
For the year 1917....	1.4	4.3	5.1	5.8	5.2	3.8	2.8	2.5	2.6	1.9	.....	2.1	3.4

ASPECT OF THE SKY (DAYS).													
Average for 12 years: ⁵	12.4	13.4	18.2	18.6	17.9	22.9	22.9	25.2	23.2	23.5	18.0	13.9	230.1
Clear.....	9.5	7.9	7.9	6.7	8.7	3.9	5.4	3.5	3.8	2.9	5.8	7.1	73.1
Partly cloudy.....	9.1	7.0	4.9	4.7	4.4	3.2	2.7	2.3	3.0	4.6	6.2	10.0	62.1
Cloudy.....													
For the year 1917:	22	9	19	17	15	30	26	27	27	31	18	21	262
Clear.....	4	3	5	5	4	0	4	2	2	0	3	7	39
Partly cloudy.....													
Cloudy.....	5	16	7	8	12	0	1	2	1	0	9	3	64

TEMPERATURE (° F.).												
Year, etc.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average for 12 years:												
Absolute maximum.....	57.2	63.8	74.1	81.1	87.3	95	100	98.8	91.8	83	73.2	60.9
Mean maximum.....	42.4	49.6	58.9	63.7	71.7	82.3	92.6	91.5	83.2	68.1	56.1	44.8
Absolute minimum.....	-0.8	7.2	12.4	21.3	27.7	36.5	44.0	41.1	23.5	23.4	9.9	4.5
Mean minimum.....	17.7	23.1	27.9	35	40.2	46.9	54.2	51.8	42.6	32.8	24.2	19.1
Mean.....	29.9	36.6	43.3	50.8	56	64.6	73.3	71.5	61.2	50.5	40.9	31.8
For the year 1917:												
Absolute maximum.....	54	60	73	78	84	97	105	99	94	89	77	69
Mean maximum.....	26.5	39.8	50.4	62	66.7	85.5	96.7	92.3	83	73.9	59	55.6
Absolute minimum.....	-25	-2	12	19	27	32	46	47	32	15	16	19
Mean minimum.....	-0.9	20.8	22.4	33.3	39.4	45.3	57.7	54.4	43.8	33.3	23.7	20.6
Mean.....	12.8	30.3	36.4	47.6	53.1	65.4	77.2	73.3	63.4	53.6	42.8	38.1
Highest 12-year record	70	72	79	89	102	101	105	103	95	89	81	72
Lowest.....	-25	-12	9	13	21	32	38	36	26	15	-1	-3

KILLING FROSTS.							
Year.	Last in spring.	First in autumn.	Frost-free period.	Year.	Last in spring.	First in autumn.	Frost-free period.
1906.....	May 31	Oct. 4	126	1913.....	May 13	Sept. 23	133
1907.....	May 14	Sept. 19	128	1914.....	Apr. 24	Sept. 9	138
1908.....	May 30	Sept. 25	118	1915.....	May 20	Sept. 14	117
1909.....	May 24	Sept. 22	121	1916.....	June 1	Sept. 10	101
1910.....	May 16	Sept. 13	120	1917.....	May 21	Sept. 25	127
1911.....	May 27	Sept. 18	114				
1912.....	May 22	Sept. 25	126	Average.....	May 20	Sept. 20	123

¹ January, February, and March, 11 years.² January and February, 7 years; March, 9 years.³ January and February, tank frozen.⁴ January, February, March, April, and November, 8 years.⁵ January, February, March, and October, 11 years.

TEMPERATURE SURVEY OF THE PROJECT.

A temperature survey of the project, carried on in cooperation with the University of Nevada, was continued as in 1916, with the thermographs stationed as follows: (1) United States Indian Reservation, 10 miles east of Fallon, altitude 3,915 feet; (2) farm of T. V. Conner, 9 miles south of Fallon, altitude 3,930 feet; (3) farm of C. G. Swingle, 14 miles west of Fallon, altitude 4,084 feet; (4) farm of W. W. Cogswell, 5 miles east of Fernley, altitude 4,180 feet; (5) the United States Indian Reservation at Pyramid Lake; and (6) the

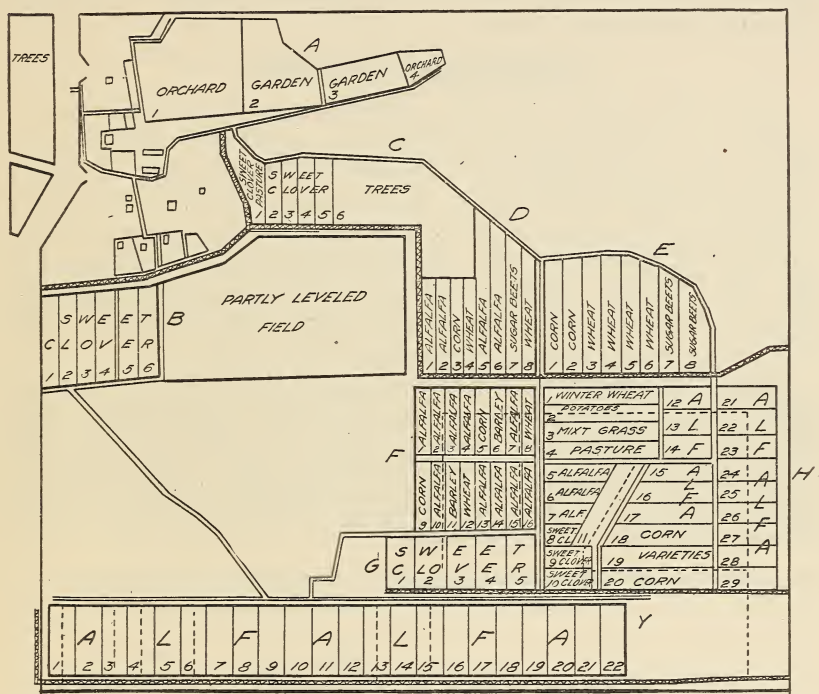


FIG. 1.—Diagram showing the arrangement of the fields and the location of the experiments on the Truckee-Carson Experiment Farm in 1917.

Truckee-Carson Experiment Farm, 1 mile south of Fallon, altitude 3,965 feet.

The records are being made for the purpose of studying the effect of topography on temperature. A comparison of the minimum temperatures is of special interest, because the character of the agriculture and the kinds of crops grown may be decidedly influenced by a difference of a few degrees in the mean minimum temperatures, especially during the critical months of May and September.

The average mean minimum temperature of the high lands (represented by the Fernley and Swingle Benches) is found to be 4.1 degrees

higher than that of the low lands (represented by the Fallon, Indian School, and Island records). The observations taken at Pyramid Lake are not included in these averages, as the station does not lie in the main agricultural section of the project and, furthermore, the temperatures at that place are apparently influenced by other factors than the relative altitude.

A comparison of the absolute minimum temperatures also shows that the high lands have a decided advantage over the low lands, the average difference being 4.5 degrees in favor of the high lands. No significant difference was found in the maximum temperatures of the high lands and the low lands.

AGRICULTURAL CONDITIONS.

In 1917 the total area under cultivation on the project was increased from 39,449 acres to 40,392 acres, an increase of 948 acres. The acreage of old alfalfa was increased from 19,541 acres to 20,360 acres, an increase of 819 acres. The acreage of potatoes was nearly doubled, but the area devoted to barley, wheat, and oats was nearly 1,000 acres less than in 1916. It is probable that this decrease in the area devoted to cereals was due to the resumption of operation of the sugar factory, resulting in the growing of beets on some of the land that would otherwise have been planted to grain.

Slightly over one-half the cultivated area of the project is producing alfalfa, but the money value of the alfalfa was approximately three times the value of all other crops combined. In 1916 the total value of all crops was estimated at \$793,391 and in 1917 at \$1,447,242, an increase in gross income to the farmers of \$654,913, which is on the average more than \$1,000 per farm.

TABLE II.—*Acreage, yields, and farm values of crops produced on the Truckee-Carson Reclamation Project in 1917.*

Crop.	Area (acres).	Unit of yield.	Yields.		Farm values.		
			Total.	Average per acre.	Per unit of yield.	Total.	Average per acre.
Alfalfa hay.....	20,360	Ton.....	72,769	3.6	15.00	\$1,091,535	\$53.65
Alfalfa (planted in 1917).....	2,141	..do.....	402	.2	15.00	6,030	2.82
Barley.....	1,116	Bushel.....	26,833	24.1	1.25	33,541	30.00
Wheat.....	2,532	..do.....	43,200	17.0	1.90	82,080	32.40
Oats.....	27	..do.....	938	34.8	1.00	938	34.75
Onions.....	14	..do.....	2,964	211.7	.35	1,037	74.10
Potatoes.....	322	..do.....	56,433	175.0	.90	50,790	157.75
Sugar beets.....	2,168	Ton.....	11,048	5.1	8.00	88,384	40.75
Hay (except alfalfa).....	940	..do.....	763	.8	10.00	7,630	8.10
Garden and miscellaneous crops.....	541	.....	.....	.....	.....	39,267	72.50
Pasture:							
Alfalfa.....		.....	.....	.....	.....	30,804	
All other.....	10,100	.....	.....	.....	.....	15,206	1.50
Less duplications.....	1,025	.....	.....	.....	.....	.....	.....
Irrigated without crop.....	1,156	.....	.....	.....	.....	.....	.....
Total.....	40,392	.....	.....	.....	.....	1,447,242	.....
Per acre.....		.....	.....	.....	.....		35.80

Table II, prepared from the reports of the United States Reclamation Service, shows the acreage, production, and value of the more important crops and the total number of acres and farm values of all crops grown on the project in 1917.

For the comparison of crop production of 1917 with previous years, Table III has been prepared, showing the acreage and production from 1912 to 1916, inclusive. This table shows that the acreage of alfalfa has steadily increased each year, while there has been considerable fluctuation in the acreage devoted to each of the other crops.

TABLE III.—*Acreage and production of leading crops on the Truckee-Carson Reclamation Project, 1912 to 1917, inclusive.*

Year.	Alfalfa.		Barley.		Wheat.		Oats.		Potatoes.		Onions.	
	Acres.	Tons.	Acres.	Bush-els.	Acres.	Bush-els.	Acres.	Bush-els.	Acres.	Bush-els.	Acres.	Bush-els.
1912.....	12,912	33,595	2,259	74,792	2,484	40,600	399	16,875	483	65,633	.....	.....
1913.....	13,960	45,132	1,880	43,238	1,560	30,271	283	19,274	416	29,789	38	10,915
1914.....	13,212	59,873	1,329	31,084	1,446	29,164	417	18,000	283	23,800	20	7,600
1915.....	18,273	53,496	1,733	49,585	2,582	54,065	428	14,375	196	25,133	17	3,053
1916.....	19,541	61,756	1,658	52,000	2,881	57,733	107	4,566	177	23,400	10	2,842
1917.....	20,360	72,769	1,116	26,833	2,532	43,233	27	938	322	56,433	14	2,964

The number and estimated value of all kinds of live stock on the project are given in Table IV. The striking thing is that there has been a decrease in the number of every kind of live stock, even including bees, and the total valuation has also decreased for all classes except sheep and bees, in spite of the general increase in unit values.

TABLE IV.—*Live stock on the Truckee-Carson Reclamation Project in 1917.*

Item.	Inventory, Dec. 31.			1916		1917		In-crease in value.	De-crease in value.
	1916, number.	1917, number.	De-crease in number.	Unit value.	Total value.	Unit value.	Total value.		
Horses.....	3,530	3,155	375	\$78.42	\$276,810	\$79.50	\$250,773	.....	\$26,037
Mules.....	381	312	69	102.58	39,085	88.00	27,440	.....	12,645
Cattle:									
Dairy.....	2,537	2,044	493	80.75	204,854	87.00	178,145	.....	26,709
Other.....	7,802	7,581	321	41.26	321,903	36.00	273,021	.....	48,882
Sheep.....	5,452	3,346	2,106	6.23	33,961	11.75	39,258	\$5,297	.....
Hogs.....	6,092	3,170	2,922	7.16	43,606	14.50	45,897	.....	2,291
Fowls:									
Turkeys.....	15,239	9,042	6,197	2.52	38,417	2.95	26,633	.....	11,781
All other.....	29,270	24,036	5,234	.59	17,157	.68	16,419	.....	738
Bees, hives.....	2,958	1,933	1,025	3.77	11,141	5.85	11,294	153	.....
Goats.....	.....	73	.....	.....	.....	14.50	1,060	.....	.....
Total.....	.....	.....	.....	.....	986,934	.....	a 868,880	.....	.....

a Value of goats not included.

The total quantity of butter fat sold to the local creamery in 1916 was 351,120 pounds, and in 1917 it was 269,546 pounds, a decrease of 81,574 pounds. This does not, of course, represent all the butter fat produced on the project, as some cream is shipped to outside creameries. The amount paid by the local creamery for butter fat was \$109,473.71, an average of 40.7 cents per pound.

ALFALFA.

The yield per acre of alfalfa on the project in 1917 was 3.6 tons, a slight increase over the yields of the three preceding years. The entire season was favorable to alfalfa production. The average yield on the experiment farm from 27 plats having a total area of 8.4 acres was 3.2 tons per acre. The yields of individual plats ranged from less than 1 ton to over 5 tons per acre. These yields do not at the present time have any experimental value. The yields of individual plats, however, do indicate the relative productivity (possibly the relative alkalinity) of the various plats and may be of value at a later date when these plats are included in rotations or other experiments.

CORN VARIETY TEST.

Fifteen varieties of field corn were planted in triplicate on May 19 in plats H-18, H-19, and H-20. The growth in plat H-20 was so irregular, due to the spotted character of the soil, that the results were discarded, using only the data obtained from plats H-18 and H-19.

The variety called Union is a yellow dent of unknown origin purchased from a local store. Four rows of this variety were planted in each check, so that the results given are from a total of eight rows instead of from two, as with the other varieties.

The moisture percentage was determined by hanging 20 weighed ears of each variety in a dry room for about 30 days and again weighing. The shelling percentage was determined by weighing the cobs after shelling and calculating the percentage of grain to the dry weight of the ears.

Table V shows yields ranging from 12 to 36 bushels per acre. The six highest yielding varieties were Minnesota No. 13, Murdock, Rainbow Flint, Rustler White Dent, Union, and Minnesota No. 23.

In Table VI the yields are recalculated so as to take into consideration the percentage stand. In the last column is given the average of the actual and theoretical yields. These figures probably represent the relative value of the varieties more accurately than the actual yields. However, the relative position of the varieties when arranged in order according to yield is seen to be about the same in the two tables.

TABLE V.—*Test of 15 varieties of corn on the Truckee-Carson Reclamation Project in 1917.*

Rank.	Variety.	Row length.	Area.	Stand.	Corn on cob.	Moisture.	Corn on cob, dry.	Shelling.	Shelled corn.	Shelled corn per acre.	
										Pounds.	Bushels.
		<i>Fect.</i>	<i>Acre.</i>	<i>Per ct.</i>	<i>Lbs.</i>	<i>Per ct.</i>	<i>Lbs.</i>	<i>Per ct.</i>	<i>Lbs.</i>		
1	Minnesota No. 13.....	706	0.057	87	172	30.5	120	82.5	99	1,735	31
2	Murdock.....	701	.056	81.5	164	30.5	114	78	89	1,585	28
3	Rainbow Flint.....	714	.057	81	176	34.5	116	78	90	1,575	28
4	Union.....	2,842	.228	76.5	651	37.5	430	80.5	346	1,520	27
5	Rustler White Dent.....	699	.056	81.5	151	30	106	78.5	84	1,500	27
6	Minnesota No. 23.....	697	.056	83	184	40	110	75.5	84	1,500	27
7	Wimples Yellow Dent.....	708	.057	80.5	145	31.5	99	79	79	1,385	25
8	Yellow Clarage.....	717	.057	83	147	32.5	99	79.5	79	1,385	25
9	N. Dak. White Dent.....	710	.057	81.5	148	35	96	78.5	76	1,330	24
10	Golden Surprise.....	726	.058	84.5	148	40	89	84.5	75	1,295	23
11	Reids Yellow Dent.....	719	.058	87.5	164	42.5	95	78.5	75	1,290	23
12	Yellow Leaming.....	721	.058	80.5	147	36.5	94	79	74	1,280	23
13	Northwestern Dent.....	703	.056	86.5	167	41.5	98	72	70	1,240	22
14	Kilbury Yellow Hybrid.....	723	.058	85.5	156	41.5	92	77.5	70	1,205	21
15	August 15.....	712	.037	72	107	39	66	77.5	51	895	16

TABLE VI.—*Actual yields of 15 varieties of corn grown on the Truckee-Carson Reclamation Project in 1917 compared with theoretical yields based on perfect stands.*

Rank.	Varieties.	Stand.	Yield per acre (pounds).		Average of actual and theoretical yields.	
			Actual.	Theoretical.	Pounds.	Bushels.
		<i>Per cent.</i>				
1	Minnesota No. 13.....	87	1,735	1,995	1,860	33.2
2	Murdock.....	81.5	1,585	1,945	1,765	31.5
3	Rainbow Flint.....	81	1,575	1,945	1,760	31.4
4	Union.....	76.5	1,520	1,985	1,750	31.2
5	Rustler White Dent.....	81.5	1,500	1,840	1,670	29.8
6	Minnesota No. 23.....	83	1,500	1,805	1,650	29.5
7	Wimples Yellow Dent.....	80.5	1,385	1,720	1,550	27.7
8	Yellow Clarage.....	83	1,385	1,670	1,530	27.3
9	North Dakota White Dent.....	81.5	1,330	1,630	1,480	26.4
10	Yellow Leaming.....	80.5	1,280	1,590	1,435	25.6
11	Golden Surprise.....	84.5	1,295	1,535	1,415	25.3
12	Reids Yellow Dent.....	87.5	1,290	1,475	1,380	24.6
13	Northwestern Dent.....	86.5	1,240	1,435	1,335	23.8
14	Kilbury Yellow Hybrid.....	85.5	1,205	1,410	1,305	23.3
15	August 15.....	72	895	1,245	1,070	19.1

CORN VARIETIES FOR FODDER PRODUCTION.

WEIGHT OF STOVER.

In order to get some idea of the relative value of the varieties of corn for fodder or silage, the stover was weighed after husking. The report of the yields of stover added to the dry weight of the corn on the cob is given in Table VII. If one were choosing a variety for high yields of both grain and forage it would appear that one of the three following would be best: Minnesota No. 13, Murdock, or Rustler White Dent.

TABLE VII.—*Yields of stover and of corn on the cob for 15 varieties of corn on the Truckee-Carson Reclamation Project in 1917.*

Rank.	Variety.	Area.	Actual yield (pounds).			Yield per acre.	
			Corn on cob.	Stover.	Corn and stover.	Corn and stover.	
		<i>Acre.</i>				<i>Pounds.</i>	<i>Tons.</i>
1	Reids Yellow Dent.....	0.058	95	490	585	10,100	5.05
2	Minnesota No. 13.....	.057	120	340	460	8,075	4.04
3	Kilbury Yellow Hybrid.....	.058	92	355	447	7,700	3.85
4	Yellow Leaming.....	.058	94	330	424	7,300	3.65
5	Murdock.....	.056	114	275	389	6,940	3.47
6	Rustler White Dent.....	.056	106	265	371	6,620	3.31
7	North Dakota White Dent.....	.057	96	255	351	6,160	3.08
8	Wimples Yellow Dent.....	.057	99	250	349	6,125	3.06
9	Union.....	.228	430	950	1,380	6,050	3.03
10	Golden Surprise.....	.058	89	260	349	6,020	3.01
11	Yellow Clarage.....	.057	99	240	339	5,950	2.98
12	Rainbow Flint.....	.057	116	200	316	5,550	2.78
13	Minnesota No. 23.....	.056	110	180	290	5,180	2.59
14	Northwestern Dent.....	.056	98	190	288	5,150	2.58
15	August 15.....	.057	66	100	166	2,920	1.46

CORN VARIETIES TESTED TWO OR MORE YEARS.

Some of the better varieties of corn have been grown each year since 1914. Others have been tested for two years. (Table VIII.) The Australian White Flint variety has proved to be one of the highest yielding and is among the earliest to mature. For short seasons it appears to be the best so far tried. It was accidentally omitted from the 1917 test. Minnesota No. 13 is a good variety and has been selected for use on the rotation plats on the experiment farm in 1918.

TABLE VIII.—*Yields of varieties of corn grown two or more years on the Truckee-Carson Reclamation Project.*

Rank.	Variety.	1914	1915	1917	Yield (bushels).	
					Total.	Average.
1	Australian White Flint.....	20	50	.....	70	35.0
2	Wimples Yellow Dent.....	.....	31	31	62	31.0
3	Minnesota No. 13.....	16	29	36	81	27.0
4	Disco Pride.....	20	34	.....	54	27.0
5	Northwestern Dent.....	23	32	26	81	27.0
6	Disco 90-Day.....	25	28	.....	53	26.5
7	Rustler White Dent.....	20	26	33	79	26.3
8	Minnesota No. 23.....	20	27	32	79	26.3
9	Disco 85-Day.....	22	30	.....	52	26.0
10	Gold Medal.....	22	25	.....	47	23.5
11	Smoky Dent.....	14	30	.....	44	22.0

BARLEY VARIETIES.

Seven varieties of barley were planted on April 11 on what is known as the Harmon-Austin Ranch of the Nevada Colony Corporation. With the exception of Trebi, which was received from the Office of Cereal Investigations, all the varieties were from seed grown the previous year in the variety tests.

The soil in the field where the varieties were grown was exceedingly variable, so that an idea of the relative value of the varieties can be obtained only by comparing the yields of the two nearest check plats, giving the greatest weight to the yield of the nearest check plat (Table IX). The mean yield of all the checks can not be taken into consideration.

It appears that only Trebi outyielded the variety designated as "local," which was purchased in a local store and was used as a check variety. But even the result with the Trebi is of doubtful value, for there was only sufficient seed to plant one check.

TABLE IX.—*Test of seven varieties of barley on the Harmon-Austin Ranch, near Fallon, Nev., in 1917.*

Plat.	Variety.	Area.		Actual yield.		Yield per acre.	
		Acre.	Pounds.	Pounds.	Bushels.		
No. 1.....	Local (check).....	0.31	251	810	16.9		
No. 2.....	Trebi.....	.29	329	1,135	23.7		
No. 3.....	Nepal.....	.29	151	521	10.9		
No. 4.....	Local (check).....	.30	371	1,235	25.7		
No. 5.....	Chevalier.....	.30	285	950	19.8		
No. 6.....	Hannchen.....	.30	345	1,150	24.0		
No. 7.....	Svanhals.....	.30	253	843	17.6		
No. 8.....	Coast.....	.31	244	787	16.4		
No. 9.....	Local (check).....	.33	319	967	20.2		
No. 10.....	Nepal.....	.33	165	500	10.4		
No. 11.....	Chevalier.....	.33	236	716	14.9		
No. 12.....	Hannchen.....	.33	307	930	19.4		
No. 13.....	Local (check).....	.42	405	965	20.1		
No. 14.....	Svanhals.....	.33	277	840	17.5		
No. 15.....	Coast.....	.33	386	1,170	24.4		
No. 16.....	Local (check).....	.17	182	1,070	22.3		

The actual yields obtained are summarized in Table X, in which the two series are combined. A variation in yield on the average of less than 2 bushels should not be considered significant.

TABLE X.—*Summary of tests of seven varieties of barley on the Truckee-Carson Reclamation Project in 1917.*

Plat.	Variety.	Yield (pounds).			Average yield.	
		East series.	West series.	Total.	Pounds.	Bushels.
No. 1.....	Trebi.....	1,135	.....	1,135	1,135	23.6
No. 2.....	Nepal.....	521	500	1,021	510	10.6
No. 3.....	Chevalier.....	950	716	1,666	833	17.4
No. 4.....	Hannchen.....	1,150	930	2,080	1,040	21.7
No. 5.....	Svanhals.....	843	840	1,683	842	17.5
No. 6.....	Coast.....	788	1,170	1,958	979	20.4
No. 7.....	Local.....	.....	.....	.....	1,010	20.5

Table XI shows the average yields of barley during the three years in which variety tests have been conducted.

The results obtained would seem to indicate that Svanhals, Chevalier, and Nepal are the least desirable of the seven varieties. The

other four varieties appear to be of about equal value. When the yields of individual years are compared, it is seen that the differences in average yield among them are not significant.

TABLE XI.—*Yields of seven varieties of barley on the Truckee-Carson Reclamation Project in the years 1915, 1916, and 1917.*

Rank.	Variety.	Yields (pounds).			Yields, 3-year average.	
		1915	1916	1917	Pounds.	Bushels.
1	Coast.....	2,040	1,765	979	1,595	33.3
2	Local.....	1,435	1,916	1,010	1,454	30.3
3	Hannechen.....	1,581	1,456	1,040	1,359	28.3
4	Svanhals.....	1,435	1,408	842	1,228	25.6
5	Chevalier.....	.....	1,504	833	1,169	24.4
6	Trebi.....	.....	.....	1,135	1,135	23.7
7	Nepal.....	1,218	1,292	510	1,007	20.9

When certain corrections are made from the actual results, taking into consideration (1) the year in which the test occurs, (2) the influence of prominent alkali spots in certain plats, and (3) the yield in comparison with the nearest "local" plat, a table of relative values can be worked out which is probably more accurate than the average actual yields. When the "local" is taken as 100, the relative values of the varieties, after having made correction of actual yields as indicated, are as follows: Trebi, 130; Coast, 113; Hannechen, 105; Local, 100; Svanhals, 87; Chevalier, 82; Nepal, 70.

ONION VARIETY TEST.

Four varieties of onions, Red Wethersfield, Silverskin, Yellow Danvers, and Australian Brown, were planted March 12 on the farm of E. S. Funk, near Fernley, Nev. The varieties were planted in double rows in duplicate, and the entire experiment was again performed in duplicate with a fertilizer consisting of equal parts of acid phosphate and gypsum applied at the rate of 250 pounds per acre. There were therefore in all four double rows of each variety. The rows were 330 feet in length and the double rows were 28 inches wide. The area of each double row was therefore 0.0177 acre. The unfertilized rows of the Australian Brown were on the outer edge of the plat, resulting in a reduced yield, so that the results for the unfertilized Australian Brown are not included in the computation. (Table XII.)

There was little difference in yield between the Yellow Danvers, Silverskin, and Red Wethersfield. As in previous tests, the Australian Brown was less productive than the other varieties. A small increase in yield apparently resulted from the application of the fertilizer.

TABLE XII.—*Test of four varieties of onions on the farm of E. S. Funk, near Fernley, Nev., in 1917.*

Test conditions.	Varieties.			
	Australian Brown.	Yellow Danvers.	Silverskin.	Red Wethersfield.
Unfertilized:				
Plat 1, yield.....pounds.....		86	82	75
Plat 2, yield.....do.....		109	130	152
Total yield.....do.....		195	212	227
Yield per acre.....hundredweight.....		114.7	124.6	133.5
Fertilized:				
Plat 1, yield.....pounds.....	53	90	85	70
Plat 2, yield.....do.....	74	182	168	153
Total yield.....do.....	127	272	251	223
Yield per acre.....hundredweight.....	74.5	160.0	147.6	131.1
Fertilized and unfertilized:				
Yield.....pounds.....		467	463	450
Yield per acre.....hundredweight.....		137.3	136.2	132.3

POTATO EXPERIMENTS.

TIME-OF-PLANTING TESTS.

In order to secure data as to the best time for planting potatoes, plantings of Burbank potatoes were made at weekly intervals during the latter part of April and throughout the month of May. The first row, which was planted April 19, was frosted to the ground after emerging, but came up again a second time. The second row, planted April 26, was slightly frosted, and the remaining four rows were not affected by the frost at any time. The earliest and latest plantings were the least productive. The highest yield was obtained from the row planted May 3. Each of the rows in the experiment was 365 feet long. The yields obtained are shown in Table XIII.

TABLE XIII.—*Yields of Burbank potatoes in time-of-planting tests on the Truckee-Carson Reclamation Project in 1917.*

Date of planting.	Yield (pounds).		Date of planting.	Yield (pounds).	
	Actual, per row.	Per 100-foot row.		Actual, per row.	Per 100-foot row.
April 19.....	308	84	May 10.....	315	86
April 26.....	362	99	May 17.....	371	102
May 3.....	405	111	May 24.....	263	72

VARIETY TEST OF POTATOES.

Fourteen varieties or strains of potatoes were planted on May 3 on plat H-2. Owing to lack of uniformity in the soil, the actual yields obtained are not of great value. It was noted, as in previous years, that potatoes of the Burbank variety and types similar to it

were much inclined to produce second growth. The smooth-growing varieties were American Wonder, Early Freeman, Irish Cobbler, Colorado Pearl, and Scotch Rose. The varieties appearing to be most desirable on account of productivity and smoothness were Netted Gem, American Wonder, Earliest of All, and Colorado Pearl. Detailed results are shown in Table XIV.

TABLE XIV.—*Yield tests of 14 varieties of potatoes on the Truckee-Carson Experiment Farm in 1917.*

Rank.	Variety.	Length of row.	Yield (pounds).		Rank.	Variety.	Length of row.	Yield (pounds).	
			Actual, per row.	Per 100-foot row.				Actual, per row.	Per 100-foot row.
		<i>Feet.</i>					<i>Feet.</i>		
1	White Victor	105	165	157	8	American Wonder..	708	699	99
2	Burbank	165	243	147	9	Hundredfold	255	187	73
3	Earliest of All	132	186	140	10	Scotch Rose	324	209	64
4	Colorado Pearl	156	188	120	11	Irish Cobbler	189	122	65
5	Netted Gem	1,067	1,252	117	12	Rural New Yorker..	81	45	56
6	Early Lunch	384	420	110	13	Early Rose	105	49	47
7	Early Freeman	201	183	91	14	Early Ohio	51	21	41

Another small variety test was conducted in the garden on plat A-2 with small lots of seed received from Mr. H. A. Hyde, of Watsonville, Cal. Table XV shows the results obtained.

TABLE XV.—*Yield tests of varieties of potatoes received from California on the Truckee-Carson Experiment Farm in 1917.*

Rank.	Variety.	Seed planted.	Length of row.	Yield (pounds).	
				Actual, per row.	Per 100-foot row.
		<i>Pounds.</i>	<i>Feet.</i>		
1	Pride of Multnomah	5	24	52	217
2	American Wonder	5	36	75	208
3	Early Prizetaker	5	27	52	193
4	Burbank	5	24	46	192
5	Scotch Rose	5	24	36	150
6	Snow	10	45	61	136
7	Producer	5	21	23	110

WHEAT VARIETY TEST.

Nine varieties of wheat were planted on March 19 to 21 on the Harmon-Austin Ranch of the Nevada Colony Corporation. All varieties were planted in duplicate with a "local" variety planted on every third or fourth plat as a check. The drill was set to seed as nearly as possible 80 pounds per acre. The harvesting of the varieties was begun on July 31 and completed on August 2. The wheat was left in shock until August 21, when thrashing was begun.

The actual yield of each plat is shown on Table XVI. It is apparent from the results here shown that certain corrections must be made. Fields I and II are each apparently quite uniform, but it is

obvious that they should not be directly compared one with the other without making corrections for the greater productivity of Field II. Field III lacks uniformity, and the plat yields can not be compared one with the other without first making corrections, using the yields of the "local" variety as a basis. (Table XVII.)

TABLE XVI.—Actual yields of 9 varieties of wheat grown on the Harmon-Austin Ranch in 1917.

Field and variety.	Plat.	Area.	Yield (pounds).		Field and variety.	Plat.	Area.	Yield (pounds).	
			Per plat.	Per acre.				Per plat.	Per acre.
Field I:		<i>Acre.</i>			Field III:		<i>Acre.</i>		
Local.....	1	0.31	794	2,560	Local.....	14	0.28	95	340
Little Club.....	2	.31	946	3,050	Little Club.....	15	.28	112	400
Rieti.....	3	.31	841	2,713	Rieti.....	16	.28	236	843
Bluestem.....	4	.31	860	2,773	Local.....	17	.28	315	1,125
Local.....	5	.31	914	2,948	Bluestem.....	18	.28	430	1,536
Defiance.....	6	.31	807	2,607	Defiance.....	19	.28	522	1,864
Marquis.....	7	.31	797	2,570	Local.....	20	.28	537	1,918
Local.....	8	.31	796	2,568	Marquis.....	21	.28	768	2,743
Field II:					Sonora.....	22	.28	784	2,800
Local.....	9	.35	1,088	3,110	Local.....	23	.28	883	3,153
Sonora.....	10	.35	1,163	3,323	Dicklow.....	24	.28	916	3,271
Dicklow.....	11	.35	1,001	2,860	Ghirka.....	25	.28	778	2,780
Ghirka.....	12	.35	813	2,323	Local.....	26	.28	665	2,375
Local.....	13	.40	1,241	3,100					

TABLE XVII.—Calculation of the relative values of 8 varieties of wheat grown on the Truckee-Carson Experiment Farm in 1917.

Variety.	Yield per acre.				Ratio of A to B.	
	South series.	North series.	Average.			“Local,” if grown on same plats, es- timated (B)
			Pounds (A).	Bushels.		
	<i>Pounds.</i>	<i>Pounds.</i>			<i>Pounds.</i>	<i>Per cent.</i>
Little Club.....	3,050	400	1,725	28.7	1,630	106
Sonora.....	3,323	2,800	3,062	51.1	2,930	104
Marquis.....	2,570	2,743	2,657	44.2	2,513	106
Bluestem.....	2,773	1,536	2,160	36.0	2,120	102
Dicklow.....	2,860	3,271	3,066	51.2	3,000	102
Rieti.....	2,713	843	1,778	29.6	1,809	98
Defiance.....	2,605	1,864	2,240	37.3	2,338	96
Ghirka.....	2,323	2,780	2,552	42.5	2,868	89

Table XVIII gives the average yields of wheat varieties for the three years, 1915, 1916, and 1917.

The crops of 1915 and 1916 were grown on fairly uniform soil, while the 1917 crop was grown in a field containing a small, relatively unproductive area, which materially reduced the average yield of three of the varieties. A table of corrected yields would give a more accurate idea of the relative merits of the varieties than when the actual yields are used, as in section A of Table XVIII.

The yields of the Little Club, Rieti, and Bluestem varieties in the north series were greatly reduced by the presence of alkali areas.

Section B of Table XVIII includes the 1917 yields of these three varieties from the south series only. For all the other varieties the yields shown in section B have been calculated as usual by averaging the two series.

TABLE XVIII.—Average yields of 8 varieties of wheat grown on the Truckee-Carson Experiment Farm in 1915, 1916, and 1917.

Variety.	Yield per acre (bushels).							
	SECTION A.—Including both north and south series.				SECTION B.—Corrected yields, eliminating alkali areas for 1917.			
	1915	1916	1917	3-year average.	1915	1916	1917	3-year average.
Little Club.....	45.5	52.2	28.7	42.1	45.5	52.2	50.8	49.5
Rieti.....	42.7	48.5	29.6	40.3	42.7	48.5	45.2	45.5
Dicklow.....	41.6	42.3	51.2	45.0	41.6	42.3	51.1	45.0
Marquis.....	39.0	42.8	44.2	42.0	37.3	40.9	51.0	43.1
Defiance.....	38.5	42.1	37.3	39.3	39.0	42.8	44.3	42.0
Sonora.....	37.3	40.9	51.1	43.1	40.5	37.2	46.2	41.3
Bluestem.....	40.5	37.2	36.0	37.9	38.5	42.1	37.2	39.3
Ghirka.....	35.0	36.2	42.5	37.9	35.0	36.2	42.5	37.9

ALKALI RECLAMATION EXPERIMENTS IN FIELD Y.

Various treatments were given to plats 1 to 18 of field Y in 1914. These treatments included the application of gypsum and sulphuric acid, subdrainage by means of tiles, the application of manure, and the growing and plowing under of sweet clover. Table XIX shows the treatment given to each plat. The alfalfa and sweet clover were seeded in the spring of 1915. Where sweet clover was grown the second crop was plowed under in 1916 and the plats seeded to alfalfa in the spring of 1917.

TABLE XIX.—Effect of treatments for the improvement of alkali land on the yields of alfalfa in field Y at the Truckee-Carson Experiment Farm in 1917.

Plat.	Treatment.	Yield per acre (pounds).					Increase over adjacent check.
		First cutting.	Second cutting.	Third cutting.	Total.	Average of treated plats.	
No. 4.....	Tile, gypsum, and manure.....	1,560	780	480	2,820	4,410	560
No. 5.....	Check.....	1,870	1,230	750	3,850		
No. 6.....	Tile, gypsum, and manure.....	2,770	2,080	1,150	6,000		
No. 7.....	Gypsum and manure.....	2,660	2,000	800	5,460	5,020	a -10
No. 8.....	Check.....	2,050	1,530	1,450	5,030		
No. 9.....	Gypsum and manure.....	2,050	1,420	1,100	4,580		
No. 10.....	Gypsum.....	1,430	2,000	700	4,130	2,680	2,440
No. 11.....	Check.....	90	80	80	250		
No. 12.....	Gypsum.....	550	470	230	1,250		
No. 16.....	Sulphuric acid.....	750	250	240	1,240	1,050	1,010
No. 17.....	Check.....	40	0	0	40		
No. 18.....	Sulphuric acid.....	500	170	190	860		

a Decrease.

The yields of plats treated with gypsum or sulphuric acid have shown a decided increase over the untreated checks. The average yield of the eight treated plats was 3,292 pounds and of the four untreated plats 2,292 pounds. The treatments have not been sufficiently beneficial to raise the yield to the point of profitable production. Plats 1, 2, 3, 13, 14, and 15 were seeded to alfalfa in the spring of 1917 and their yields are therefore not included.

TOMATOES.

Sixteen varieties of tomatoes were planted in the greenhouse early in March in a sandy loam soil obtained from the garden plat A-2. They were transplanted in the beds once and transferred to the field, plat A-3, May 28. The season was unusually favorable for tomato production, but unfortunately the soil in plat A-3 was not good, as this plat had been covered two years before with raw soil in order to raise the general level. The vines made poor growth and the yield was light.

The earliest varieties were found to be Earlibell, Earliana, Yellow Pear, and Early Jewel.

The best yielding varieties were Earlibell, Early Prolific, Earliana, Perfection, and John Baer. (Table XX.)

TABLE XX.—*Test of 16 varieties of tomatoes on the Truckee-Carson Experiment Farm in 1917.*

Rank.	Variety.	Plat 1.		Plat 2.			Yield.	
		Date first ripe.	Yield per plant.	Date first ripe.	Yield per plant.	Number of plants.	Total.	Average per plant.
			<i>Pounds.</i>		<i>Pounds.</i>		<i>Pounds.</i>	<i>Pounds.</i>
1	Earlibell.....	Aug. 25	3.5	Aug. 20	7.5	50	274.3	5.5
2	Early Prolific.....	..do....	4.8	Aug. 25	4.8	50	240.8	4.8
3	Earliana.....	..do....	3.3	Aug. 20	3.8	50	177.6	3.6
4	Perfection.....	Aug. 27	3.4	Aug. 25	3.0	50	159.7	3.2
5	John Baer.....	Aug. 20	2.9	..do....	3.0	50	147.8	3.0
6	Earliana.....	..do....	2.9	Aug. 20	2.5	50	135.8	2.7
7	Early Jewel.....	..do....	3.1	..do....	2.2	50	133.3	2.7
8	Favorite.....	Sept. 3	2.4	Aug. 29	2.2	50	114.8	2.3
9	Bonny Best.....	Aug. 25	2.6	..do....	1.2	50	94.3	1.9
10	Yellow Pear.....	Aug. 20	2.3	Aug. 20	1.4	50	92.3	1.8
11	Dwarf Champion.....	Aug. 25	1.1	Aug. 29	1.6	50	67.3	1.3
12	Beauty.....	Sept. 3	1.6	Sept. 3	.9	50	62.0	1.2
13	Stone.....	Sept. 7	1.4	..do....	1.1	50	61.8	1.2
14	Ponderosa.....	Aug. 29	.8	..do....	.8	50	39.8	.8
15	Globe.....	Sept. 7	.9	..do....	.6	50	36.3	.7
16	Coreless.....	Sept. 13	.7	Sept. 18	.4	50	27.0	.5

BLOSSOMING PERIOD OF FRUIT-TREE VARIETIES.

In both 1916 and 1917 a record was kept of the blossoming period of fruit trees in field A-3. It is interesting to note that the date of blossoming was several weeks earlier in 1916 than in 1917. The crop of 1916 was caught by frost, so that little fruit was obtained,

while in 1917 a fairly good crop was harvested. Table XXI compares the blossoming dates of the two years.

TABLE XXI.—*Blossoming period of fruit-tree varieties in field A-4 on the Truckee-Carson Experiment Farm in 1916 and 1917.*

Row and tree No.	Kind and variety.	1916		1917	
		Buds first open.	Full bloom.	Buds first open.	Full bloom.
Row I:	Apple:				
1.....	Arkansas Black.....	Apr. 17	Apr. 25	May 7	May 16
2.....	Ben Davis.....	Apr. 20	..do..	..do..	May 20
3.....	Akin.....	Apr. 17	Apr. 22	..do..	May 16
4.....	Ralls.....	Apr. 22	Apr. 28	May 12	May 20
5.....	Sierra.....	Apr. 20	Apr. 26	May 7	Do.
6.....	Shackleford.....	..do..	Apr. 25	..do..	Do.
7.....	Babbitt.....	Apr. 14	Apr. 20	..do..	May 11
8.....	Banana.....	Apr. 20	Apr. 25	..do..	Do.
Row II:					
1.....	Coos.....	Apr. 18	..do..	..do..	May 20
2.....	Opalescent.....	Apr. 20	..do..	..do..	May 20
3.....	Yellow Bellflower.....	Apr. 13	Apr. 20	May 10	May 20
4.....	Gano.....	Apr. 20	Apr. 25	..do..	Do.
5.....	Red Astrachan.....	Apr. 13	Apr. 20	May 4	May 12
6.....	Golden Sweet.....	Apr. 18	Apr. 25	May 7	May 12
7.....	Mann.....	..do..	..do..	May 1	May 8
8.....	Hyslop (crab).....	Apr. 13	Apr. 20	..do..	Do.
Row III:					
2.....	Wismer.....	Apr. 14	Apr. 22	May 5	May 10
4.....	Waxen.....	Apr. 13	Apr. 20	May 6	May 16
Row IV:					
1.....	Transcendent (crab).....	..do..	..do..	Apr. 30	May 7
2.....	Winter Banana.....	Apr. 13	..do..	May 10	May 20
3.....	Haas.....	Apr. 20	Apr. 25	..do..	Do.
Row V:	Pear:				
1.....	Barry.....	..do..	Apr. 13	..do..	May 7
2.....	Kieffer.....	..do..	..do..	Apr. 25	Do.
3.....	Worden.....	..do..	..do..	Apr. 30	Do.
Row VI:					
1.....	Easter Beaurre.....	..do..	..do..	..do..	May 8
2.....	Climax (plum).....	..do..	..do..	Apr. 20	..do..
3.....	Sugar (prune).....	..do..	..do..	Apr. 26	May 7

EXPERIMENT WITH EELWORM-INFESTED POTATOES.

One of the more serious diseases of potatoes in Nevada is that caused by the presence of what is locally known as the potato eelworm (*Heterodera radiculicola*). Although it is known to infest and damage to some extent other cultivated crops, it appears so far to have been a serious menace in Nevada only to the potato. The disease has been spread from year to year by the sale of infested seed potatoes. Badly infested seed has each year been offered for sale in the local markets, and farmers have purchased it either because they were not aware of the presence of the eelworm or because no clean seed was readily available.

Prof. Peter Frandsen, of the University of Nevada, has been experimenting with eelworm-infested potatoes for several years, making studies of their life history and experimenting with methods of control. He has obtained some valuable results, among which the one of greatest immediate interest to potato growers is the observation that eelworms and eggs in the potatoes are killed at a temperature between 35° and 40° C. (95° to 104° F.) continued for a sufficient

length of time. In order to test the efficacy and practicability of this method of treating seed, experiments have been conducted at this farm.

Potatoes (125 pounds) badly infested with eelworms were purchased, divided into nine lots, and given temperature treatments, as follows: Lot 2 was heated at 30° C. for 24 hours, lot 3 at 35° for 12 hours, lot 4 at 35° for 18 hours, lot 5 at 35° for 24 hours, lot 6 at 40° for 6 hours, lot 7 at 40° for 12 hours, lot 8 at 40° for 18 hours, and lot 9 at 40° for 24 hours. Lot 1 was untreated.

After the temperature treatment the potatoes were soaked in a corrosive sublimate solution for 2 hours and planted on May 10 in rows 36 feet long, three rows being devoted to each lot of seed.

On June 23 a germination count was made to determine the effect of treatment on germination. It was found that germination was apparently stimulated by a temperature of 30° C. and was decidedly reduced by a treatment of 40° C. regardless of the length of time at which they were kept at this temperature.

The crop was harvested on October 13, and the yield of each row was weighed. The germination counts made on June 23 and the yields are given in Table XXII.

TABLE XXII.—*Germination and yield tests of potatoes grown from eelworm-infested seed on the Truckee-Carson Experiment Farm in 1917.*

Temperature (° C.) treatment and row.	Number of plants emerged on June 23.		Yield (pounds).	
	Per row.	Total.	Per row.	Total.
No treatment:				
Row 1.....	23	73	27	67
Row 2.....	25		19	
Row 3.....	25		21	
At 30° for 24 hours:				
Row 4.....	28	85	19	62
Row 5.....	28		22	
Row 6.....	29		21	
At 35° for 12 hours:				
Row 7.....	24	65	20	57
Row 8.....	21		21	
Row 9.....	20		16	
At 35° for 18 hours:				
Row 10.....	26	69	18	56
Row 11.....	23		22	
Row 12.....	20		16	
At 35° for 24 hours:				
Row 13.....	20	60	8	43
Row 14.....	17		15	
Row 15.....	23		20	
At 40° for 6 hours:				
Row 16.....	18	52	27	78
Row 17.....	17		25	
Row 18.....	17		26	
At 40° for 12 hours:				
Row 19.....	14	34	21	61
Row 20.....	13		26	
Row 21.....	7		14	
At 40° for 18 hours:				
Row 22.....	13	28	16	40
Row 23.....	8		12	
Row 24.....	7		12	
At 40° for 24 hours:				
Row 25.....	11	37	9	30
Row 26.....	14		9	
Row 27.....	12		8	

After the crop was harvested, a part of the product from each treatment was sent to Prof. Frandsen, of the University of Nevada, for determination of the infestation, and the remainder of the potatoes were retained at the farm, so that two sets of counts were made, as shown in Table XXIII.

TABLE XXIII.—*Results of temperature experiments on eelworm-infested potatoes on the Truckee-Carson Experiment Farm in 1917.*

Temperature (° C.) treatment and lot counted.	Number of potatoes observed.	Potatoes showing eelworm infestation.								
		Number.				Per cent.				
		None.	Light.	Medium.	Heavy.	None.	Light.	Medium.	Heavy.	Total infested.
Check seed not treated:										
Truckee-Carson	157	61	50	24	22	39	32	15	14	61
University of Nevada	170	95	42	22	11	56	24	13	7	44
Total or average	327	156	92	46	33	48	28	14	10	52
At 30° for 24 hours:										
Truckee-Carson	147	64	45	14	24	43	31	10	16	57
University of Nevada	188	78	46	49	15	42	24	26	8	58
Total or average	325	142	91	63	39	42	27	19	12	58
At 35° for 12 hours:										
Truckee-Carson	152	105	34	7	6	69	22	5	4	31
University of Nevada	116	82	23	5	6	70	20	4	5	30
Total or average	268	187	57	12	12	70	21	5	4	30
At 35° for 18 hours:										
Truckee-Carson	102	68	17	7	10	66	17	7	10	34
University of Nevada	118	79	27	8	4	67	23	6	4	33
Total or average	220	147	44	15	14	67	20	7	6	33
At 35° for 24 hours:										
Truckee-Carson	98	84	6	5	3	86	6	5	3	14
University of Nevada	96	79	15	2	0	82	15	2	0	18
Total or average	194	163	21	7	3	84	11	4	1	16
At 40° for 6 hours:										
Truckee-Carson	152	132	10	5	5	87	7	3	3	13
University of Nevada	138	105	23	9	1	76	16	6	1	24
Total or average	290	237	33	14	6	82	11	5	2	18
At 40° for 12 hours:										
Truckee-Carson	116	73	26	12	5	63	23	10	4	37
University of Nevada	55	42	11	2	0	77	20	3	0	23
Total or average	171	115	37	14	5	67	22	8	3	33
At 40° for 18 hours:										
Truckee-Carson	112	95	16	1	0	85	14	1	0	15
University of Nevada	84	80	3	1	0	95	4	1	0	5
Total or average	196	175	19	2	0	89	10	1	0	11
At 40° for 24 hours:										
Truckee-Carson	96	91	1	1	3	95	1	1	3	5
University of Nevada	76	67	9	0	0	89	11	0	0	11
Total or average	172	158	10	1	3	92	6	1	1	8

It appears that treatment of the seed at either 35° or 40° C. (95° to 104° F.) resulted in a marked reduction of the infestation in the resulting crop. The original seed used was very heavily infested, and it is probable that with lightly infested seed the percentage of

eelworms surviving would be somewhat less. The experiment would have been more valuable if check rows of noninfested seed had been planted between the treated plats.

EXPERIMENT WITH PASTURE GRASSES.

About 2 acres of mixed grasses were planted in June, 1917, on the farm of S. B. Pray, at Fernley. The soil had been farmed about 10 years and among other crops had grown alfalfa. The sowing was at the rate of 29 pounds per acre, the proportion of varieties being as follows: Alsike clover, 2 pounds; meadow fescue, 2 pounds; brome-grass, 7 pounds; oat-grass, 6 pounds; orchard grass, 5 pounds; rye-grass, 3 pounds; Kentucky bluegrass, 3 pounds.

All the varieties, except probably Kentucky bluegrass, made a rank growth the first year. Some hay was cut, and it was used for fall pasture.

The 5 acres of grass pasture which was planted on the farm of F. E. Mobley in 1916 made a fair growth, but it was not possible to obtain a measure of the yield. Mr. Mobley has a large herd of dairy cattle, and these were pastured on the experimental plat for a short time each day, but under the method used no idea could be obtained as to the number of cattle the pasture would support. The grasses on this field, however, never grew so vigorously as they did on the farm of Mr. Pray. This may be due to the fact that the grasses at Mr. Mobley's were planted on raw soil that had not been previously farmed.

Two milch cows were pastured at the experiment farm throughout the season on the mixed-grass pasture, plats H-3 and H-4, but it was necessary to supplement the pasture with sweet-clover pasture on fields C-2 and C-3. In the early spring and during the summer the cows were given a small daily feed of alfalfa hay whenever it seemed that the pasture was not supplying sufficient feed. The area of the pasture was 1 acre, and it was estimated that $1\frac{1}{2}$ acres would have been necessary to provide sufficient continuous pasture for two cows. The grass had made sufficient growth for pasturing by May 1 and continued to supply pasture until some time in October.

VALUE OF TANKAGE FED TO PIGS ON SWEET-CLOVER PASTURE.

Nine pigs weighing 340 pounds were put in sweet-clover pasture, plats C-2 and C-3, on April 21. During the first four weeks they were fed a daily ration of $10\frac{1}{4}$ pounds of rolled barley. During this time they made poor gains, requiring 6.55 pounds of grain to produce 1 pound of gain in weight.

Beginning with May 17 tankage was added to the grain ration, which was changed to $9\frac{1}{4}$ pounds of rolled barley and 1 pound of tankage daily. This same ration was fed for four weeks, when the tankage was increased to $1\frac{1}{2}$ pounds daily. In spite of the fact that

the percentage of the grain ration was constantly decreasing, the pigs made much better gains than during the first four weeks on the pasture without tankage. The amount of grain (including tankage) required to produce 1 pound of gain was reduced from 6.55 to 2.30 pounds. It would seem that tankage has a tonic effect for pigs on sweet clover. The necessity of making further experiments is suggested, in which pigs on alfalfa and sweet clover have the grain ration supplemented with and without tankage. The detailed features of the experiment with pigs on sweet-clover pasture are shown in Table XXIV.

TABLE XXIV.—*Results of a test with pigs pastured on sweet clover with and without tankage on the Truckee-Carson Experiment Farm in 1917.*

Item of comparison.	Without tankage.					With tankage.						
	Apr. 21 to 28.	Apr. 28 to May 5.	May 5 to 12.	May 12 to 19.	Apr. 21 to May 19.	May 19 to 26.	May 26 to June 2.	June 2 to 9.	June 9 to 16.	June 16 to 23.	May 19 to June 23.	
Initial weight.....pounds..	340	351	363	378	340	384	414	419	461	506	384	
Final weight.....do.....	351	363	378	384	384	414	419	461	506	542	542	
Gain.....do.....	11	12	15	6	44	30	5	42	45	36	158	
Daily gain.....per cent.....	0.46	0.49	0.58	0.23	0.44	1.09	0.17	1.38	1.34	0.99	1.00	
Barley fed.....pounds.....	72	72	72	72	288	65	65	65	65	65	325	
Tankage fed.....do.....	0	0	0	0	0	7	7	7	7	10	38	
Ratio of daily ration to initial weight.....per cent.....	3.0	2.9	2.8	2.7	.....	2.7	2.5	2.4	2.2	2.1	.....
Grain fed per pound of gain.....pounds.....	6.55	6.0	4.8	12.0	6.55	2.4	14.4	1.72	1.6	2.1	2.30	

SWEET CLOVER AND ALFALFA COMPARED AS PASTURE FOR PIGS.

The sweet-clover pasture used in this experiment was located in field C and included plats 2 and 3, having a combined area of 0.5 of an acre. There was an abundance of growth until about September 1.

The alfalfa pasture used in this experiment was located in field H and included all of plat 5 and one-half of plat 6. The pasture contained 0.3 of an acre until August 20, when it was enlarged to 0.4 of an acre. The stand of alfalfa was not good, and as the plats contained alkali spots, the growth was not vigorous in all parts. The pigs probably would have made better gains if they had had a better pasture. For this reason the gains made by the alfalfa-fed lot are not strictly comparable with the gains made by those on sweet clover.

Both the sweet clover and alfalfa pastures became short about the middle of September, and on September 22 the grain ration was increased to 3 per cent of the live weight. The pigs were removed from the pasture on October 20 and put into pens for fattening.

While on the 2 per cent ration the pigs on the sweet-clover pasture made a total gain of 377 pounds, as compared with 329 pounds made by those on the alfalfa pasture. The gains of the pigs on sweet clover were more economical than the gains made by those on alfalfa,

the former requiring 3.1 and the latter 3.5 pounds of feed to produce 1 pound of gain. In 1916 the pigs on alfalfa pasture required only 2.4 pounds of feed to produce 1 pound of gain.

During the four weeks in which they were given the 3 per cent ration, the sweet-clover lot required 5.3 pounds of feed and the alfalfa lot 4.8 pounds of feed to produce 1 pound of gain. Table XXV shows the details of the experiment.

TABLE XXV.—*Comparison of sweet clover and alfalfa as pasture for pigs in tests on the Truckee-Carson Experiment Farm in 1917.*

Item of comparison.	June 30 to Sept. 22.		Sept. 22 to Oct. 20.	
	Sweet clover.	Alfalfa.	Sweet clover.	Alfalfa.
Duration of test.....days..	84	84	28	28
Number of pigs fed.....	9	8	9	8
Initial weight.....pounds..	527	537	904	866
Final weight.....do.....	904	866	1,057	1,028
Gain.....do.....	377	329	153	162
Daily gain per pig.....do.....	0.50	0.49	0.61	0.72
Daily gain.....per cent.....	.78	.57	.56	.62
Barley fed.....pounds.....	873	869	676	647
Tankage fed.....do.....	295	293	133	130
Concentrates fed:				
Total.....do.....	1,168	1,162	809	777
Daily average.....do.....	13.9	13.8	28.9	27.8
Per pound of gain.....do.....	3.10	3.54	5.29	4.80

BARLEY COMPARED WITH CORN FOR FATTENING PIGS.

Two lots of pigs were fed from October 20 to November 17 so as to compare the effects of corn and barley rations on growth. Those receiving barley are designated as lot 1 and those receiving corn as lot 2.

TABLE XXVI.—*Barley and corn compared in the dry-lot feeding of pigs on the Truckee-Carson Experiment Farm in 1917.*

Item of comparison.	Oct. 20 to 30.		Oct. 30 to Nov. 9.		Nov. 9 to 17.		Oct. 20 to Nov. 17.	
	Lot 1, barley.	Lot 2, corn.	Lot 1, barley.	Lot 2, corn.	Lot 1, barley.	Lot 2, corn.	Lot 1, barley.	Lot 2, corn.
Duration of test.....days..	10	10	10	10	8	8	28	28
Number of pigs fed.....	7	10	8	9	8	9		
Initial weight.....pounds..	869	1,216	1,145	1,253	1,243	1,350		
Final weight.....do.....	1,004	1,394	1,243	1,350	1,321	1,469		
Gain.....do.....	135	178	98	97	78	119	311	394
Daily gain per pig.....do.....	1.93	1.78	1.22	1.08	1.22	1.65	1.45	1.51
Daily gain.....per cent.....	1.46	1.38	.83	.75	.77	1.07		
Grain fed.....pounds.....	330	350	470	530	416	448	1,216	1,328
Tankage fed.....do.....	70	70	100	100	80	88	250	258
Concentrates fed:								
Total.....do.....	400	420	570	630	496	536	1,466	1,586
Daily average.....do.....	40	42	57	63	62	67	52	57
Per pound of gain.....do.....	3.0	2.4	5.82	6.5	6.36	4.5	4.72	4.03
Ratio of daily ration to initial weight.....per cent.....	4.6	3.5	5.0	5.0	5.0	5.0		

The plan of the experiment was to feed a 4 per cent grain ration during the first period of 10 days and increase it to 5 per cent during the remaining feeding periods. Early in the first feeding period, however, one of the pigs accidentally got into the corn lot, where he remained until the close of that period, so that during this time the

barley lot actually received a 4.6 per cent ration and the corn lot a 3.5 per cent ration.

One-sixth of the total grain ration in each case consisted of tankage. An unlimited supply of alfalfa hay was given at all times, but this was not weighed. The corn was fed on the cob, but was calculated in the ration as shelled corn, after having found by trial that the shelled corn was 70 per cent of the weight of the ear corn.

The results show that lot 1 required 4.7 pounds of feed to produce 1 pound of gain and lot 2 required 4 pounds. The experiment, therefore, indicated that corn is the more economical when the price per pound is the same. The detailed features of the experiment are given in Table XXVI.

HAND FEEDING AND SELF-FEEDING OF PIGS.

In this experiment one lot of pigs was fed a 4.5 per cent total grain ration made up of rolled barley, shorts, and tankage in the following proportions: Barley, 44 pounds; shorts, 15 pounds; tankage, 7 pounds. On November 28 the feeding of shorts was discontinued, no more being available. The daily gain was 0.89 per cent, and the concentrated feed required to produce 1 pound of gain was 4.7 pounds.

By means of a self-feeder the other lot was fed an unlimited supply of barley, shorts, and tankage for the first 11 days, after which the shorts were not available. The daily gain was 1.05 per cent, and the grain required to produce 1 pound of gain was 5.6 pounds. Further details of the experiment are shown in Table XXVII.

TABLE XXVII.—*Results of hand feeding as compared with the use of a self-feeder for pigs on the Truckee-Carson Experiment Farm in 1917.*

Item of comparison.	Self-fed lot.	Hand-fed lot.	Item of comparison.	Self-fed lot.	Hand-fed lot.
Duration of test.....days..	18	18	Shorts fed.....pounds..	293	165
Number of pigs fed.....	8	9	Tankage fed.....do....	20	126
Initial weight.....pounds..	1,321	1,469	Concentrates fed:		
Final weight.....do....	1,592	1,722	Total.....do....	1,517	1,118
Gain.....do....	271	253	Per pound of gain.....do....	5.6	4.7
Daily gain per pig.....do....	1.50	1.40	Ratio of daily ration to initial		
Daily gain.....per cent..	1.50	.89	weight.....per cent..	6.4	4.5
Barley.....pounds..	1,204	879			

It appears that the self-fed lot made more rapid gains than those fed by hand, but the gains of the former were more expensive. The price received when sold on December 5 was 15½ cents live weight. The cost of grain fed was 3 cents a pound, the local retail price of tankage, barley, and shorts having been the same for each. The self-fed lot was therefore fed at a small loss, as it cost 16.8 cents to produce 1 pound of gain. The other lot had a slight margin of profit.

Approved:

WM. A. TAYLOR,
Chief of Bureau.

JULY 3, 1918.